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Non Invasive Imaging

CARDIAC REHABILITATION IMPROVES MYOCARDIAL BLOOD FLOW RESERVE AS ASSESSED BY POSITRON EMISSION TOMOGRAPHIC MYOCARDIAL PERFUSION IMAGING

Poster Contributions
Hall C
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Session Title: Cardiac Positron Emission Tomography: Current and Newer Applications
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Background: Reduced myocardial flow reserve (MFR) is an independent predictor of future risk of major adverse coronary events. Positron emission tomography (PET) is an accepted method for quantifying MFR noninvasively. Cardiac rehabilitation (CR) has been shown to have numerous beneficial effects including improved overall health status (blood pressure, lipid profile) as well as reduced all-cause and cardiac-specific mortality.

Methods: Thirty patients with coronary artery disease (CAD) documented by a medical history of at least one of the following: acute myocardial infarction, coronary artery bypass surgery, percutaneous coronary intervention, or chronic stable angina, were evaluated in a prospective, randomized, single-blinded fashion. Patients were randomly assigned to optimal medical therapy (OMT) plus 30-36 sessions of CR or to standard OMT alone. There were 15 patients (8 males) assigned to CR with an average age of 63.1±9 years and 15 patients (8 males) assigned to the control group with an average age of 65.9 ±10 years. The effect of structured CR on absolute MFR was assessed using 13N-ammonia PET for rest and adenosine stress myocardial perfusion imaging. Quantitative PET MFR assessment was performed at baseline and at 12 weeks of follow-up using INVIA 4DM™ for MFR quantification.

Results: There was no significant difference between the two groups in age, gender, or clinical characteristics including baseline systolic or diastolic blood pressure, heart rate, or body mass index. For the control group the initial average total myocardial flow reserve was 2.01± 0.57 mL/min/g and for the rehab group 2.10± 0.49 mL/min/g (p=0.65). After 12 weeks of follow-up, the MFR in the control patients was 2.49± 0.88 mL/min/g (p=0.08). Following 12 weeks of rehabilitation, the MFR in the CR group had increased to 2.48 ±0.62 mL/min/g (p=0.03).

Conclusion: Patients enrolled in a CR program demonstrated significantly improved MFR based upon follow-up PET imaging at an average follow-up period of 12 weeks. While more randomized clinical trials examining the long-term effects of cardiac rehabilitation programs are necessary, our data implies a significant physiologic benefit.